Exponents

Positive

Rule

$a^m \cdot a^n = a^{m+n}$

Example

$x^3 \cdot x^4 = x^{3+4} = x^7$

Rule

$\frac{a^m}{a^n} = a^{m-n}$

Example

$\frac{z^8}{z^5} = z^{8-5} = z^3$

Rule

$(a^m)^n = a^{m \cdot n}$

Example

$(w^3)^6 = w^{3 \cdot 6} = w^{18}$

Rule

$\left(\frac{a^m}{b^n}\right)^p = \frac{a^{m \cdot p}}{b^{n \cdot p}}$

Example

$\left(\frac{x^3}{y^5}\right)^7 = \frac{x^{3 \cdot 7}}{y^{5 \cdot 7}} = \frac{x^{21}}{y^{35}}$

1) $\frac{x^{12}}{x^7} =$

2) $\frac{x^9}{x^5} =$

3) $\frac{r^3}{r^3} =$

3) $\frac{2m^5}{m^3} =$

4) $\frac{5z^2}{25z} =$

5) $\frac{9w^7}{3w^5} =$

6) $\frac{8x^6}{4x^4} =$

7) $\frac{4a^5}{2a^2} =$

8) $\frac{21z^8}{7z^6} =$

9) $\frac{12w^6}{36w^2} =$

10) $\frac{x^6y^2}{x^2y} =$

10) $\frac{x^6y^2}{x^2y} =$

11) $\frac{m^4p^6}{m^2p^3} =$

12) $\frac{3x^2y}{xy} =$

13) $\frac{13w^7x^9y^3}{26w^4y^2} =$

14) $(2x)^3 \cdot (4x) =$

15) $\left(\frac{w^4}{w^2}\right)^5 =$

16) $\left(\frac{xy^3z^2}{yz}\right)^7 =$

17) $\frac{3a^3b^2c}{abc} =$

18) $\frac{15x^2y^2z^4}{5x^2yz^2} =$

19) $\frac{x^5}{y^3} \cdot \frac{y^7}{x^5} =$

20) $16a^3b \div 4ab =$

Exponents

Positive | Solutions

1) $\frac{x^{12}}{x^7} = x^{12-7} = x^5$

2) $\frac{x^9}{x^5} = x^{9-5} = x^4$

3) $\frac{r^3}{r^3} = r^{3-3} = r^0 = 1$

3) $\frac{2m^5}{m^3} = \frac{2}{1} \cdot m^{5-3} = 2m^2$

4) $\frac{5z^2}{25z} = \frac{5}{25} \cdot z^{2-1} = \frac{1}{5} \cdot z = \frac{z}{5}$

5) $\frac{9w^7}{3w^5} = \frac{9}{3} \cdot z^{7-5} = \frac{3}{1} \cdot z^2 = 3z^2$

6) $\frac{8x^6}{4x^4} = \frac{8}{4} \cdot x^{6-4} = \frac{2}{1} \cdot x^2 = 2x^2$

7) $\frac{4a^5}{2a^2} = \frac{4}{2} \cdot a^{5-2} = 2 \cdot a^3 = 2a^3$

8) $\frac{21z^8}{7z^6} = \frac{21}{7} \cdot z^{8-6} = 3 \cdot z^2 = 3z^2$

9) $\frac{12w^6}{36w^2} = \frac{12}{36} \cdot w^{6-2} = \frac{1}{3} \cdot w^4 = \frac{1}{3}w^4$

10) $\frac{x^6y^2}{x^2y} = \frac{x^6}{x^2} \cdot \frac{y^2}{y} = x^{6-2} \cdot y^{2-1}$
$= x^4y$

11) $\frac{m^4p^6}{m^2p^3} = \frac{m^4}{m^2} \cdot \frac{p^6}{p^3} = m^{4-2} \cdot p^{6-3}$
$= m^2p^3$

12) $\frac{3x^2y}{xy} = \frac{3}{1} \cdot \frac{x^2}{x} \cdot \frac{y}{y} = \frac{3}{1} \cdot x^{2-1}y^{1-1} = 3x$

13) $\frac{13w^7x^9y^3}{26w^4y^2} = \frac{13}{26} \cdot w^{7-4} \cdot x^9 \cdot y^{3-2}$
$= \frac{1}{2}w^3x^9y$

14) $(2x)^3 \cdot (4x) = 2^3x^3 \cdot 4x = 8x^3 \cdot 4x = 32x^4$

15) $\left(\frac{w^4}{w^2}\right)^5 = (w^{4-2})^5 = (w^2)^5 = w^{2 \cdot 5} = w^{10}$

16) $\left(\frac{xy^3z^2}{yz}\right)^7 = (x \cdot y^{3-1}z^{2-1})^7 = (xy^2z)^7$
$= x^7 \cdot y^{2 \cdot 7} \cdot z^7 = x^7y^{14}z^7$

17) $\frac{3a^3b^2c}{abc} = 3 \cdot a^{3-1} \cdot b^{2-1} \cdot c^{1-1} = 3a^2b$

18) $\frac{15x^2y^2z^4}{5x^2yz^2} = \frac{15}{3} \cdot x^{2-2} \cdot y^{2-1}z^{4-2} = 5yz^2$

19) $\frac{x^5}{y^3} \cdot \frac{y^7}{x^5} = \frac{x^5}{x^5} \cdot \frac{y^7}{y^3} = x^{5-5} \cdot y^{7-3} = y^4$

20) $16a^3b \div 4ab = \frac{16a^3b}{4ab} = \frac{16}{4} \cdot \frac{a^3}{a} \cdot \frac{b}{b} = 4 \cdot$
$a^{3-1} \cdot b^{1-1} = 4a^2$